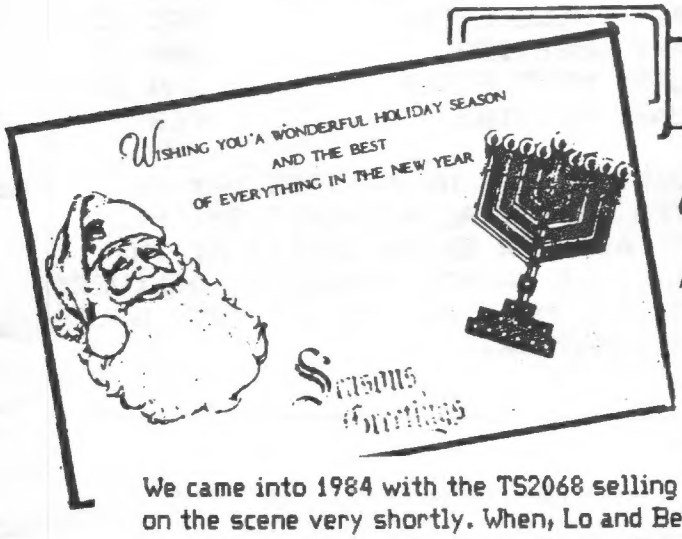
CATS NEWSLETTER

CAPITOL AREA TIMEX/SINCLAIR USERS GROUP :Formerly
Prince George's
Timex/Sinclair User's Group



VOLUME 2, NO. 9
DECEMBER, 1984

AS we come to the last month in the year it seems like a good time to look back on the events of 1984.

We came into 1984 with the TS2068 selling great guns with the outlook for future peripherals to come on the scene very shortly. When, Lo and Behold, TIMEX folded their tents and silently sneaked out of the picture. It sort of left us all in a state of bewilderment. Where does the TIMEX machine go from here?

We saw the folding of SYNC Magazine. The demise of Timex Sinclair User. Softsync stopped producing Timex Programs. Gladstone dumped their inventory on the market at crazy low prices. Many of the more han 100 suppliers to the public of TIMEX peripherals and programs scrambled in all directions to obtain merchandise to sell to the owners of TIMEX machines. We saw the TIMEX modem introduced by TIMEX but taken over by WESTRIDGE COMMUNICATIONS. Then suddenly the untimely death of Stewart Lotwin caused another break in the Modem distribution. Now handled by ZEBRA SYSTEM of New York and EZ-KEY of Quincy, Mass. as well as a handful of other people across the country.

We saw the introduction of the EMULATOR to convert the TW2068 to using Spectrum programs. We also were very interested in Bill Russell's ROMSWITCH. In addition there was a flood of SPECTRUM Software coming over from England.

Sir Clive finally came out with his QL in England which unfortunately has been having problems. We sincerely hope he can clear up the bugs so the FCC will approve the import of the QL into this country. Sinclair Research of Boston is all geared up to distribute the QL via Mailorder around the first of the year. It's too bad that Sinclair doesn't think enough of the Dealers in this country to let them distribute the QL and be the supplier to the public instead of a Box Number and a Phone number taking orders. Sinclair would certainly get more support from the public if they operated with a dealer Network. See story this issue.

cont pg 2.

CATS NEWSLETTER
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AD RATES APPEAR ON PAGE 30

For this issue contributors appear below.

Any suggestions for material you would like to see in future issues will be considered if you submit your suggestions to the EDITOR. The address for submissions appears below with the deadline calander.

HOW ABOUT SOME LETTERS TO THE EDITOR?

Jules

1984 & 1985 MEETING DATES and NEWSLETTER DEADLINES

DECEMBER MEETING	DEC 8
JANUARY NEWSLETTER	DEC 12
JANUARY MEETING	JAM 12
FEBRUARY NEWSLETTER	JAN 15
FEBRUARY MEETING	FEB 9

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CONTRIBUTORS++++++++++++++

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CATS NEWSLETTER EDITOR
POST OFFICE BOX 452
RANDALSTOWN, MD 21133

BYTE BACK finally released their MD68 modem with switch to accomodate both the 2068 as well as the 1000. We're finding more and more TIMEX users on the COMPUSERVE NETWORK as well as a proliferation of Bulletin Boards around the country. See items on BBS later in this issue.

That guy on the West Coast with Initials DH is still spouting that he is negotiating with TIMEX. TIMEX says they havn't heard from him.

We have further news on those SPECTRUM programs that run on the ROMSWITCH from our mysterious tester.

As promised we bring you from Jolly OLD ENGLAND a story on converting 1000/ZX81 programs to run on Spectrum/2068.

A great story on the NEW SPECTRUM PLUS. Also Artificial Intelligence for the QL.

Congratulations to Philip Doughty and his bride Andrea, on the birth of a daughter CARLA Elizabeth. Hope baby and mom are doing great. Have you gotten the baby her own TIMEX yet?

For those experimenters we bring this month an Emulator for less than $20. A neat program on Looping the 2068 and a Scanning outline for the 2068.

We have a few announcments of new Bulletn Boards.

I hope you have all enjoyed the CATS Newsletter since I took over as EDITOR, PUBLISHER and CIRCULATION Manager and other positions. I look forward to your comments on this issue.

I Wish You All A Happy and Healthy New Year in 1985.

Jules

President's Column

Merry Christmas! I hope you like this year-end issue. There's time enough to see what else is in here, but first....

Renewals.

Please renew! The membership dues are entirely used to produce this newsletter. I know that a number of members have gone on to other machines - to you I say, stick with us as well, and let the rest of us know how other machines differ! The coming year will be a time of maturing interests. I look forward to hearing about the projects that club members start. Because of the Timex's low cost, we also have a large percentage of beginning computerists. Welcome beginers! There is room for more members to find better ways to introduce newcomers to BASIC.

The November meeting

We had more people than usual in attendance. It was a warm day, and the heating system was stuck ON, so we had a little bit of July in November, until we got all the doors opened. Jules brought news of the Timex repair system (he's been getting a user's-eye view of that lately), as well as the latest developments on the hardware front. Tom Bent told us about a tape version of MEMOTEXT that's being developed by Fred Nachbaur (not released yet). After the break, I gave a presentation on the basics of interfacing "big" printers to the Timexes, while Jules presented a short workshop on MODEMs. We had millions of door prizes, and a lot of fun giving them out.

After the meeting, we had the second CATS potluck. When I announced the potluck, I didn't give a date or time, assuming that everyone knew that it would be held just after the November meeting. Oh well. Perhaps because of my oversight, turnout was light; but I can tell you that those that attended had a good time. A big round of thanks to Audry and Bob Curnutt! I hope they'll be willing to host another potluck sometime in the future.

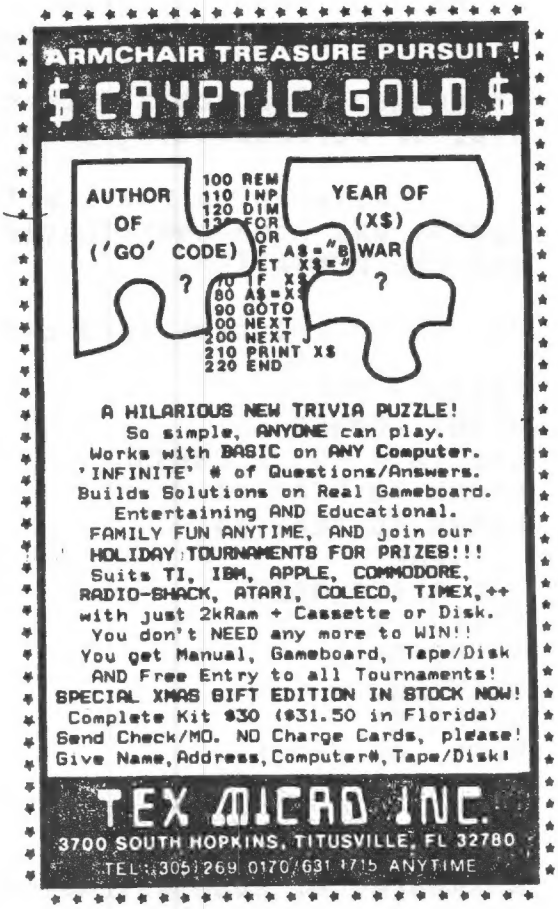
Next Meeting

There are rumbles in the bushes that a Sinclair QL may be available by December. If so, you can bet I'll try to get it in. I'll also try to return to the small SIG group format for the second half - it's frustrating, but there's something for everyone then. If you have any thoughts about the structure of the club, meeting formats, etc., LET ME KNOW. Letters on this subject will be run in the newsletter, to provide a forum for discussion. Don't forget to pick up a club roster at the next meeting. If you can't make it, send a full-size SASE to 700 Erie Ave., Takoma Park MD 20912, and I'll get a roster back to you.

Other developments

Response to the IRS2 program continues: ranging from "wonderful structure, but it doesn't do anything!" to "fantastic! I've been trying out scenarios for days." Myron Criswell sent in a modified program, that allows a choice of filing status. I'll run a list of the modifications next month. By the way, there is one major correction to the program: change line two to: 2 REM BASED ON J. R. FLANNAGAN PGM. Sorry about that, John. To repeat, IRS was developed by John R. Flannagan, of Bowie, then rewritten (and credited to another) by myself.

Mark Fisher *Mark Fisher*



SPECTRUM SPECTRUM SPECTRUM

If you have Spectrum Software please get in touch with Alan Pollock c/o the CATS NEWSLETTER or phone him 202-363-2244 after 7 P.M. and weekends. We would like Alan to test the SPECTRUM Software for CATS reviews. Editor.

****
* ROMSWITCH NEWS *
****

This column is intended for those TS 2068 users who own or are contemplating the purchase of a G. Russell Electronics - ROMSWITCH. The switch allows the 2068 owner to use the Spectrum 3 Rom inside the machine alongside the 2068 Rom. This in turn allows quite a few English Spectrum programs to be utilized on the 2068.

Today's column will deal only with listing those Spectrum programs that we have loaded into the 2068 equipped with a ROMSWITCH and shown to either run successfully or crash.

Time does not permit us to review and give a value judgment to each of these programs since program value is in the eye of the user anyway. Reading ZX Computing, Your Computer and some other English computer magazines, will tell you a lot about Spectrum programs. Contacting other user groups around the country, as we did, or corresponding with friends in England will also help.

We want to thank all those users from around the U.S. and Canada who have contributed their experiences with Spectrum programs and the ROMSWITCH.

OK, these programs load and run:

FIGHTER PILOT
NIGHT GUNNER
SPECTRUM VOICE CHESS
LEARN TO READ #1
LEARN TO READ #4
ZIP-ZAP
THE ALIEN MAZE
GREEDY GULTCH
PANDEMONIA
CRAWLER
ORPHEUS
WOODS OF WINTER
THE GREAT DETECTIVE
ZARAKS
RESCUE
ASTRON(mach. code assembler)
AHHH!!!
MANIC MINER
ATIC ATAC
JET SET WILLY
I'M IN SHOCK
DRAUGHTS(checkers)
DERBY DAY(horse race)
GRAND NATIONAL(steeple chase)
OMEGA RUN
SPECTRAL INVADERS
STONKERS
BIRDS AND BEES
RABBIT SHOOT
DOMINOES
ARCAIDA(Runs 98%)
TASWORD TWO
TEST MATCH(cricket)

These programs crashed in the night:

CHEQUERED FLAG
WARLOCK'S TREASURE
GORGON
PENETRATOR(spectrum)
GALACTIC PATROL
STARGAZER
THE KNIGHTS QUEST

Anyone who has been able to load and run the programs that we list as crashed, please drop a note to the editor and we will periodically print an updated list.

Conversion tips

A guide to ZX81/Spectrum program conversions from David Nowotnik.

The versions of BASIC offered by the two ZX computers are so similar that many programs for one can be used by the other. The ZX81 has only two commands which are not present on the Spectrum, SCROLL and UNPLOT, and these should cause you few problems when converting ZX81 programs to the Spectrum (see Table 1).

There are quite a lot of commands and functions on the Spectrum which are not available on the ZX81. A list of these appears in Table 4. The stars indicate those commands and functions for which there is no simple translation to ZX81 BASIC. Those for colour and sound can be ommitted; but you will have to find some alternative for the high resolution and file I/O commands.

The command PLOT appears on both computers, but the effect is quite different, so beware! Another tip: PEEK and POKE should be used with caution. In conversion, addresses will almost certainly have to be changed. Some of those changes appear in the tables. A command such as POKE USR "a"... on the Spectrum indicates User Defined Graphics; ZX81 users don't have this facility, so you'll have to omit this and use a standard character instead.

ZX81	Spectrum	Comments
SCROLL	RANDOMISE USR 3582 or LET t=USR 3582	If the program uses random numbers, they could become rather predictable with the first option. If so, use the second, using a variable (in this case t) which is otherwise not used.
PLOT Y,X	PRINT AT 21−Y/2,X/2;	Print the appropriate quarter square graphics character.
UNPLOT Y,X	PRINT AT 21−Y/2,X/2;	Print a space, or the appropriate quarter square graphics character.

Table 1 ZX81 to Spectrum conversions.

Spectrum	ZX81	Comments
BIN eg LET y=BIN 10010101	LET y=(decimal no.) Conversion to decimal: 10010101=149 128 64 32 16 8 4 2 1 Add these numbers together when a 1 appears at the appropriate position in binary.	BIN allows the representation of a number in binary. On the ZX81 use the decimal equivalent, but beware; BIN is often used with User Defined Graphics, which are not available on the ZX81.
READ/DATA eg READ x,y DATA 50,60	LET LET X=50 LET Y=60	READ and DATA are used to store a lot of information in a program. Use LET instead.
DEF FN and FN eg DEF a(x)=SQR x LET t=FN a(i)	LET X$="SQR X" LET X=I LET T= VAL X$	The defined function can appear in a string. Use the keyword for built-in functions (eg SQR). The equivalent of FN may need 2 lines, as shown.
PLOT	no equivalent	
SCREEN$ eg LET a=SCREEN$ x,y	LET A=PEEK(PEEK 16396 +256*PEEK 16397+1+Y+33*X)	Used in interactive games to detect characters in the display file. Note — this formula only works when a RAM pack is fitted.

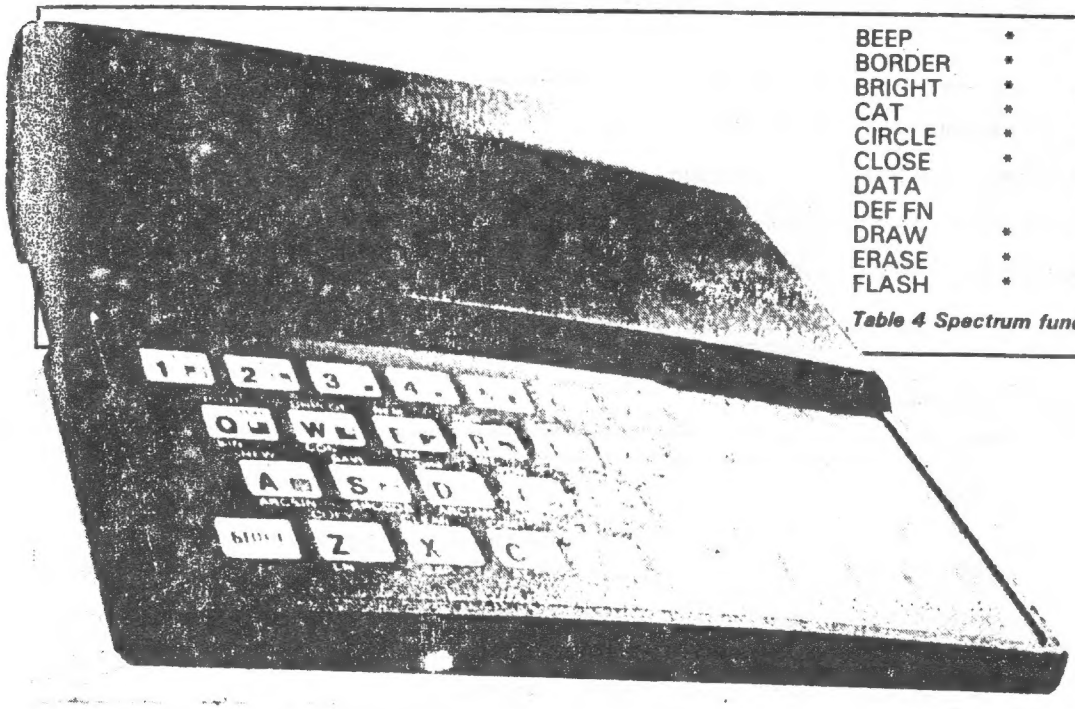
cont pg 6

Table 2 Spectrum to ZX81 conversions.

PROGRAMMING TIPS

ZX81	Spectrum	Comments
1 FRAMES POKE 16436,255 POKE 16437,255	POKE 23672,0:POKE 23673,0	Both computers have a counter which accurately varies by 50 every second. In the example, use the first line to start the 'clock'. The variable T will have the time in seconds after the start. The counter can only be used for 10 minutes.
LET T=(65535–PEEK 16436–256*PEEK 16437)/50	LET t=(PEEK 23672+256*PEEK 23673)/50 For times greater than 10 minutes, you can use byte 23674 as well.	
2 Line number zero		
POKE 16510,0	POKE 23756,0 (As the start of BASIC can move, eg with microdrives) use with caution.	Converts the first line of a program to line number zero. which cannot be edited, and so is protected.
3 RAMTOP POKE 16388,X–256*INT (X/256) POKE 16389,INT (X/256)	CLEAR x	Creates a safe area at the top of RAM starting at address x, for storing data, machine code etc.

Table 3 General Interconversion hints.



BEEP	*	FORMAT	*	ATTR	*
BORDER	*	INK	*	BIN	
BRIGHT	*	INVERSE		FN	
CAT	*	MERGE	*	IN	*
CIRCLE	*	MOVE	*	OVER	*
CLOSE	*	OPEN	*	POINT	*
DATA		OUT	*	SCREEN$	
DEF FN		PAPER	*	VAL$	*
DRAW	*	READ			
ERASE	*	RESTORE	*		
FLASH	*	VERIFY	*		

Table 4 Spectrum functions not available on the ZX81.

System Variables Conversion Table.

Variable	ZX81/ T/S1000	Spectrum/ TS2068
BREG	16414	23655
CDFLAG	16443	No Equivalent
CH ADD	16406	23645
COORDS	16438	23677
COORDS (Byte 2)	16439	23678
DEST	16402	23629
DF CC	16398	23684
D FILE	16396	No Equivalent
DF SZ	16418	23659
E LINE	16404	23641
ERR NR	16384	23610
E PPC	16294	23625
ERR SP	16386	23613
FLAGS	16385	23611
FLAGX	16429	23665
FRAMES	16436	23672
LAST K	16421	23560
MARGIN	16424	No Equivalent
MEM	16415	23656
MEMBOTT	16477	23698
MODE	16390	23617
NXTLIN	16425	23637
OLDPCC	16427	23662
PPC	16391	23621
PRBUFF	16444	23296
PR CC	16440	23680
RAMTOP	16388	23730
SEED	16434	23670
S PSN	16441	23688
S POSN (Byte 2)	16442	23689
STKBOT	16410	23651
STKEND	16412	23653
S TOP	16419	23660
STRLEN	16430	23666
T-ADDR	16432	23668
VARS	16400	23627
VERSN	16393	No Equivalent
X PTR	16408	23647

'HOOKED' ON TRIVIAL PURSUITS? OWN ANY HOME COMPUTER?

Then try $CRYPTIC GOLD$ for Intriguing New Twists to a popular game. It's an ingenious blend of TRIVIA and Simple BASIC for ALL Computers which is Entertaining, Educational, and includes frequent CASH PRIZES for Initiative, General Knowledge and Aquired Skill.

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Questions are pitched at every Age and Occupation, so little Johnny will know some Answers, Teenagers some more, Mom or Dad others and Grandma or Grandpa the rest. We involve EVERYONE in this Game.

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$CRYPTIC GOLD$ beats Trivial Pursuit and all of its other derivatives hands-down because there are an almost INFINITE NUMBER of Trigger Codes, Questions and Answers it can process: the variety of a Total Language is its ONLY limitation!

WHAT IS THE LONGEST ENGLISH SYNONYM OF 'CRYPTIC'? Who knows and who cares? It's typical Trivia. But the Right Answer can generate ANY Next Question, and this loop continues until the Last 'Question', which can actually be ANY Message, such as "Now find the Candy in the Fridge !"

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They begin when we publish Puzzle 'GO' Codes in a National Daily Newspaper, so EVERYONE starts TOGETHER and, using our real Gameboard, just ANYONE could win the Secret Four-Figure-Dollar Prize.

The FIRST Owner-Player to unscramble our Cryptic Claim Message and obey its Instructions will CAPTURE THE WHOLE POT OF 'GOLD'!!

Win or lose, you can try again soon. We also offer a Special Honor to ANYONE who 'CRACKS' our Tournament 'GO' Codes prior to publication, because we are sure our Questions and Answers CANNOT be PEEKED!

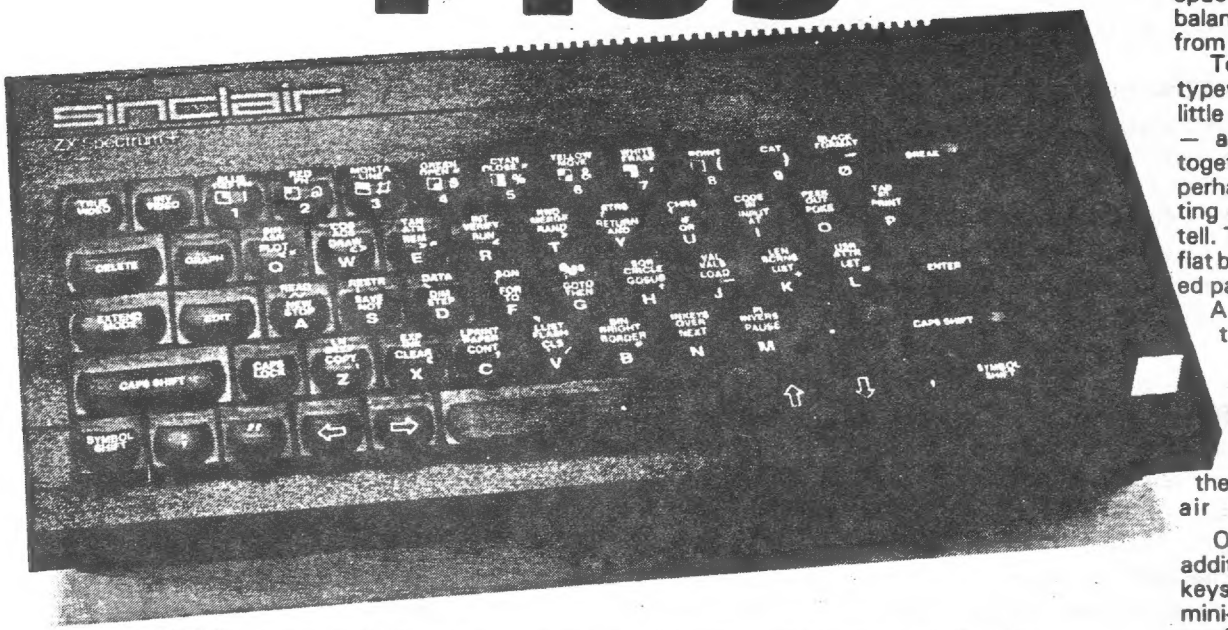
Between Tournaments our Fun Games keep you amused and our Question Generator Program composes YOUR OWN Games to test the wits of your 'Enemies', Friends and Family alike! It's usefulness is astounding; from a Secret Message System for the Kids (Parents would NEVER guess your 'GO' Code!) to a Grade pusher-upper in which, say, only the Right Answer to a Math Formula will give out the next one to try.

By the way, most Tournament Questions are easy enough considering the sizeable Prize, but some, including the first, may require an Encyclopaedia, a Dictionary or a trip to a Library. Computing speed, or getting the $GOLD$ Code first, won't Win you the Game.

It's knowing where to look or who to ask, and being prepared.

cont pg 21

The Spectrum Plus



Without the usual blaze of publicity, Sinclair Research slipped onto the market their latest production model of the Spectrum. It arrived unannounced at the office and was, even though rumours were rife, quite a surprise!

First impressions

On opening the box an impressive, and exciting looking, machine lay before us. Its style was very similar to the QL, squarer, and much more solid looking than the usual Spectrum, every inch a "real" computer. What wonderous electronics were hidden beneath the case? Perhaps an American TS2068 operating system?

The first thing to strike me was that the keyboard no longer consisted of the rubber pads which put off so many people, and that the colourful key legends had all been replaced by white letters on black keys.

Secondly, the user manual was different and although not so artistic on the cover, was full of colourful pictures and interesting looking examples, albeit somewhat thinner than the original.

Finally, the Horizons tape (as supplied with the ordinary spectrum) has been replaced with a cassette containing six, new, programs.

A close look

Examining the computer more carefully revealed that in fact it was the 48K Sepctrum PCB we know — housed in a new keyboard. This means of course that the wealth of Spectrum software will still be usable on the Spectrum+ much to the relief of many I would imagine!

All the Spectrum hardware peripherals will also be compatible, although due to the raised height of the case some units which have a "lip" to fit over the normal keyboard will not fit securely. This includes such established items as DK'Tronics, Kempston and Cheetah interfaces. It is, of course, fully compatible with the ZX Microdrives and the Sinclair Interfaces I and II.

So lets take a critical look, remembering that for roughly the same cost, £179.95, you could buy a Spectrum and a separate keyboard.

The keyboard

This appears (without dismantling the computer) to be the standard membrane type with rubber keys topped off by plastic keys. This actually works quite well, the action is firm and the keys spring back quickly. They feel good to touch and travel solidly down with the exception of the two CAPS SHIFT and the ENTER key which tend to wobble somewhat. The half size space bar however, is well balanced and it does not suffer from this.

To anyone used to using a typewriter the keys may seem a little quiet — no satisfying click — and they are a little close together for fast typing, but perhaps this is a matter of getting used to and only time will tell. The keys are, like the QL's, flat but with slightly raised, dished pads to them.

A nice touch is the addition of two rear legs which may be lowered to give the keyboard a slant forward. Of course if you have anything attached to the port at the back it then is left hanging in the air by its connector!

One impressive feature is the addition and choice of extra keys. The most obvious is the mini-space bar, but there are a total of 58 keys in all.

A double sized CAPS SHIFT key is provided at the bottom of each side of the keyboard, and the enter key is a large inverse L shaped key *a la* QL.

At each bottom corner a symbol shift key is provided and single key entry or access of True-Video, Inverse Video, Delete, Graphics, Extended (E) mode, Edit, Caps Lock, Break, ; " , . and the cursor keys is also provided. This layout makes programming much easier, and once you get used to it, it is a great advantage.

The extra cursor keys are nicely positioned for games players but unfortunately, because they are already Caps Shifted, won't work on many of the existing games using the cursor keys. Finally, on the left, tucked safely under the overhang of the top of the keyboard is a small button. This is the RESET button. When stuck in a game which has disabled the Break key, or when your computer locks up with that machine code routine, no longer do you have to keep pulling out the plug. Just press the

cont pg 9

button! A great saving on the wear-and-tear of the Power socket.

The manual

This is a much better manual than the original. It's bright, well written, interesting and it starts with the setting up of your computer and then leaps straight in with simple programs.

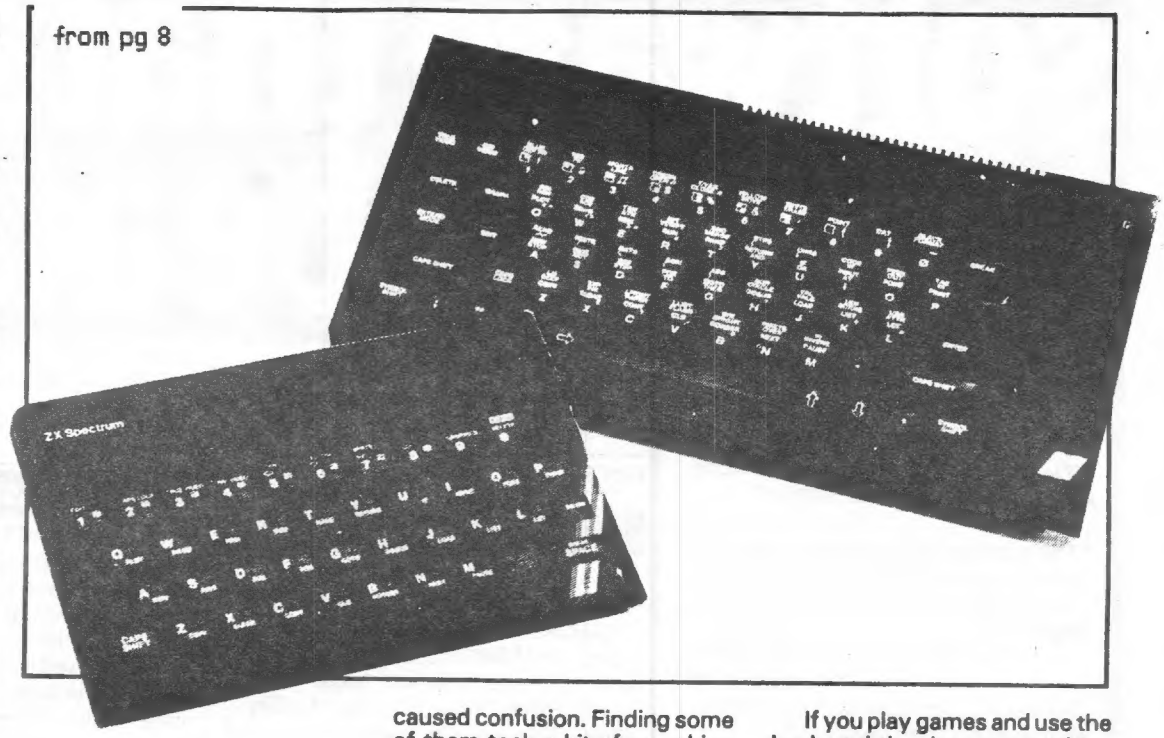
Colour photographs have been used to show examples of the screen display at the important stages and the whole approach is geared to simple explanations. Some owners of Spectrums were keen to borrow the manual and try out some of the little programs. One person said, after trying the UDG section; "Oh! So that's how Binary and UDG's are related!" — and he has had his spectrum for nearly eight months.

Although the manual is a slimmer volume, as far as I can se all the information held in the original is included in this one. The only criticism I can think of is that experienced users may find it confusing to find out a specific item of information — ie. The hex code of a particular character.

In use

The keyboard is a great improvement, and the extra keys make programming much easier, but my tame touch typist found them unsuitable for typing at speed.

from pg 8



I found that although I've been using a Spectrum for as long as they've been available, the fact that keywords are printed in white ON THE KEY caused confusion. Finding some of them took a bit of searching and yet I thought I knew all their positions. Actually, they are laid out quite logically; command keywords and symbol shift keywords are on the dished part of the key and the old E mode green and red keywords are on the flat bit behind the key. Again perhaps time and practise will remove this problem.

If you play games and use the keyboard the the more positive action and dished tops are much better, although because some of the key positions have been adjusted, some of the games are more awkward to play.

If you use a joystick and interface then there is no difference!

Assessment

A beautiful looking machine which is a big improvement on the basic Spectrum. It is not perfect, but then what computer is! The manual is one of the best I've seen, especially for beginners, and that includes those for some very expensive machines.

Sinclair Research tell me that they have no plans to sell the keyboard separately — so that the old style Spectrums can't be upgraded — but that the manual will be on sale in most computer shops for £4.95.

Personally I think there are keyboards around that are as good, If not better, for about the same price as this one costs — especially if you want a specific feature such as the numeric keypads to be found on some. However for those who do not want the fuss of adding their own this is a good alternative. A fully keyboard owner was quite envious!

It seems that Sir Clive has listened to the critics and made an effort to modify his machine with their comments in mind. All things considered, I would say that the price is a little high for what you get. At around ten pounds less the Spectrum + would be excellent value for money.

software that's hard to beat...

48K SPECTRUM

TASWORD TWO

The Word Processor ✸

"If you have been looking for a word processor, then look no further."
CRASH June 1984

"The number of on-screen prompts, together with the excellent manual, make it ideal – even for an absolute beginner."
PERSONAL COMPUTER WORLD
September 1983

"Without doubt, the best utility I have reviewed for the Spectrum."
HOME COMPUTING WEEKLY
April 1984

Your Spectrum becomes a professional standard word processor with TASWORD TWO. Sixty-four characters per line on the screen is just one of the many features of this versatile program. The cassette also contains TASWORD TWO TUTOR. This teaches you word processing using TASWORD TWO. Whether you have serious applications or simply want to learn about word processing, TASWORD TWO and TASWORD TWO TUTOR make it easy and enjoyable. TASWORD TWO is readily adapted for the microdrives to give super-fast saving and loading of both program and text.

PRICE £13.90

TASCOPY

The Screen Copier

Screen copy software for ZX Interface 1. Print high resolution screen copies (in a choice of two sizes), and also large "shaded" copies with different dot densities for the various screen colours. Tascopy supports all eight pin dot matrix printers with Epson type control codes. e.g. Epson RX-80 and FX-80, Shinwa CP-80, Mannesmann Tally MT-80, Star DMP 510/515, Brother HR5.

PRICE £9.90

TASMERGE

The Mail Merger

Transfer data from MASTERFILE to TASWORD TWO! Letters and forms typed on TASWORD can be printed with addresses and data taken from MASTERFILE. The mail merge facility allows, for example, multiple copies of a letter to be printed, each containing a different name and address taken from your MASTERFILE data. To use TASMERGE you must have one or more microdrives as well as TASWORD and MASTERFILE by Campbell Systems. (version 9 or later).

PRICE £10.90

TASPRINT

The Style Writer

A must for dot-matrix printer owners! Print your program output and listings in a choice of five impressive print styles. TASPRINT utilises the graphics capabilities of dot-matrix printers to form, with a double pass of the printhead, output in a range of five fonts varying from the futuristic DATA-RUN to the hand-writing style of PALACE SCRIPT. TASPRINT drives all dot-matrix printers with bit image graphics capabilities and can be used to print TASWORD TWO text files. TASPRINT gives your output originality and style!

PRICE £9.90

TASWIDE

The Screen Stretcher

With this machine code utility you can write your own Basic programs that will, with normal PRINT statements, print onto the screen in the compact lettering used by TASWORD TWO. With TASWIDE you can double the information shown on the screen!

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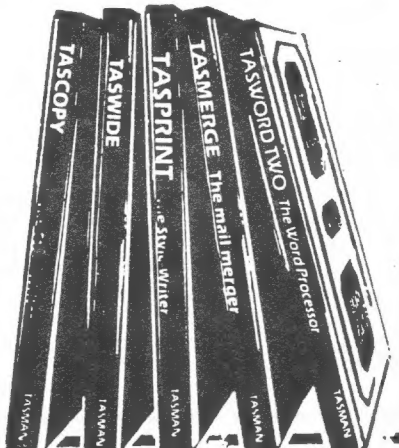

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Artificial Intelligence on the QL

Artificial Intelligence is the science of making machines do things that would require intelligence if done by men. In this article, Tim Hartnell examines a simple artificial intelligence program for the QL

Artificial Intelligence (AI) is a fascinating field, where science fact interacts with science fiction.

Since the first computers were built, anguished debates have been fought over topics such as: Can a machine really think? What is the nature of intelligence, and will a machine ever be built which can partake of that nature?

Programs have been written which allow computers to display many actions which appear intelligent. Machines can now learn and reason, can talk with people, obey them and advise them. As achievements in the field accumulate, the question 'is the computer really thinking?' has taken a back seat. The approach nowadays tends to be along the lines of: 'It doesn't matter whether the computer is *really* thinking or not. So long as it can reach apparently intelligent conclusions, which work in practice, we can assume intelligence is present'.

There is a limited number of experts in the world on any one subject. It doesn't matter what field you're talking about — mending cars, mining for uranium, diagnosing human illness, sorting edible mushrooms from poisonous ones — there is a limit to the number of experts we have available.

Now while the world is not exactly crying out for more mushroom-sorting experts, there are areas of the world (most of it in fact) where there are not enough doctors. If intelligent computers could help overcome this shortage, it would be of immense benefit.

Using computers to act intelligently to assist or replace experts is one area of AI where great strides have been made in the past two decades. The name of the field is 'expert systems', in which the computer program is used to 'capture' the expertise of an expert in such a way that a non-expert can tap that information. The program in this article will demonstrate a simple expert system in use on the QL.

In its simplest form, an expert system is a series of IF/THEN statements. A diagnostic system could be as simple as this:

> IF the patient is coughing
> AND he has recently been soaked to the skin
> AND then stood in a freezing wind for an hour
> THEN the patient has a cold

Of course, one would hardly need an expert system to make a diagnosis like this.

It is interesting that many human experts do not know exactly how they reach their conclusions. Building an expert system for a particular area can be as much of a revelation to the human expert as to the person creating the knowledge base for the computer program. In the book *The Fifth Generation — Artificial Intellience and Japan's Computer Challenge to the World* (Feigenbaum and McCorduck) we read the very sad story of an expert who willingly explained his methods to a 'knowledge engineer' (the name given to those who draw out others' expertise and then modify it for the computer program) The expert was highly regarded (and well-paid) for his expertise, and was at first disbelieving when the knowledge engineer discovered the expertise could be reduced to a few hundred working rules of thumb'. From disbelief, the expert's view changed to one of depression, and finally he quit the field, a broken man.

While running our expert system (and developing your own) is hardly likely to have as dramatic effect on you as our human expert experienced, you will learn a great deal about how such systems are developed.

There are a number of successful systems around. They include DENDRAL which is able to work out facts about molecular structures from raw chemical data; EURISKO, which is able to learn as it works, which creates three-dimensional microelectric circuits; TAXMAN, which examines the tax rules in America and gives customers advice on how best to operate within the rules; and GENESIS, which allows scientists to plan and simulate gene-splicing arrangements.

I'm afraid we won't be getting into gene-slicing just yet, although we will be finding some interesting applications for our expert system, such as solving the everyday problem of telling the difference between a man, a horse and a sparrow.

Our system is called SPURT. Run the following program on your QL, and you'll see SPURT in action. It asks you three questions, and from them determines which of the three (the man, the horse or the sparrow) you were thinking of.

After setting the scene, with the line numbers up to 60, the real business of determining which creature you're thinking about begins, with the section of code from 170 to 290. You'll see in the part of the program from lines 310 to 350, the variable COUNT is set to zero at the start of the run, and incremented by one each time a 'yes' answer is given. Using this information, SPURT has no trouble deciding which creature you're thinking about (lines 250 through to 290). As you can see, it is a pretty simple program, but one which lays the foundation upon which expert systems could be built. From it, you can develop programs which — for example — could do things like predict the mean failure time of stressed metals. Use our framework, and try to develop your own expert system in a field of your choice.

This article is based on the books *Exploring Artificial Intelligence on your QL and Exploring Artifical Intelligence on your ZX Spectrum.* The books are £6.95 each, and are available from the publishers, Interface Publications, 9/11 Kensington High Street, London W8 5NP.

```
10 REMark =====
12 REMark SPURT
14 REMark =====
16 :
20 initialise
25 REPeat main_loop
30  PRINT: PRINT "I want you to think
 of"\"  a man"\"     a horse"\"       o
r a sparrow"
```

cont pg 12

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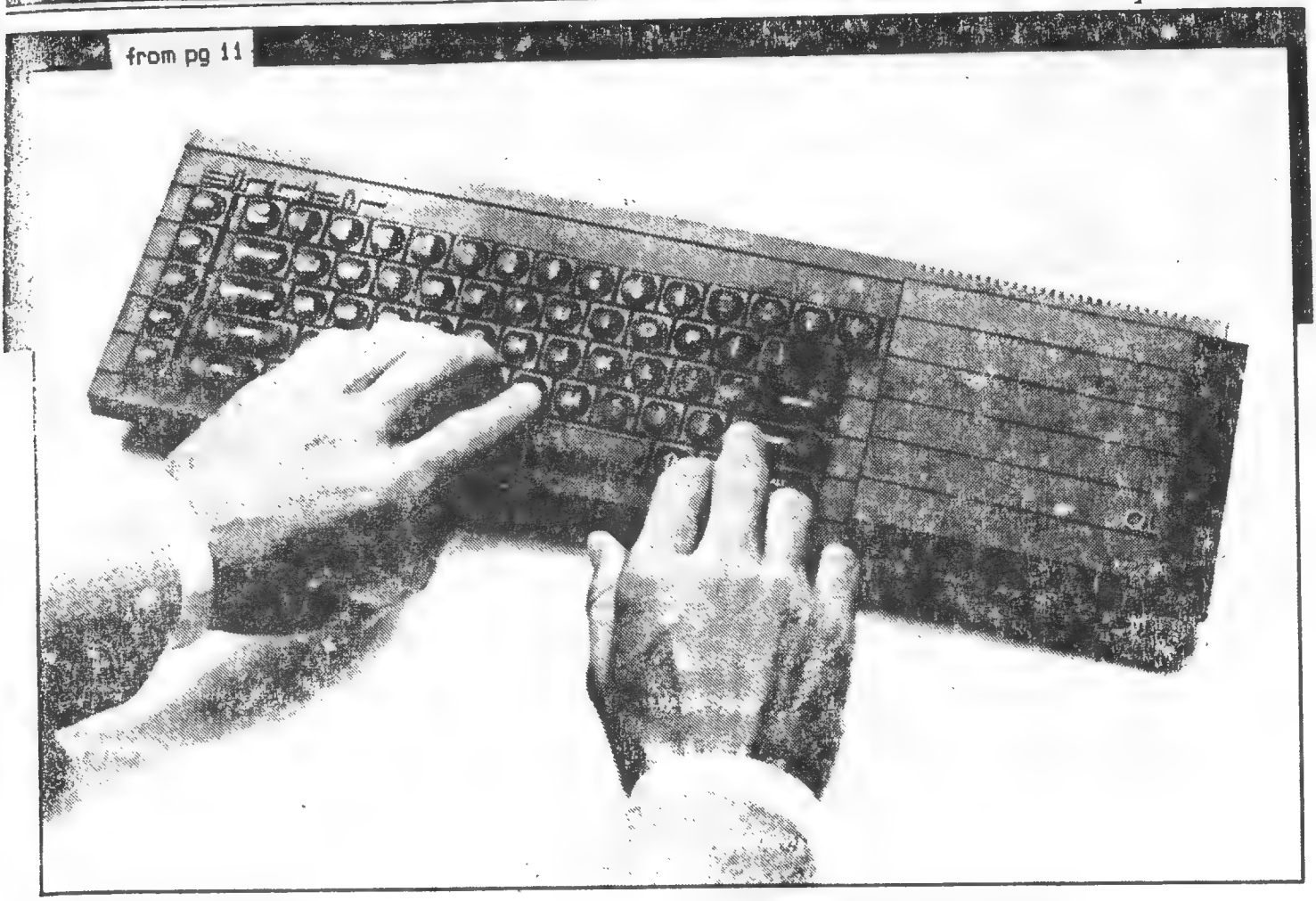


```
50  PAUSE 200
60  PRINT: PRINT
70  ask_questions
80  PRINT
90  PRINT "-------------------------
---------"
100  PRINT: PRINT "Press ENTER for an
other one , or"
110  PRINT "any key and then ENTER to
 quit"
120  INPUT q$
130  IF q$<>"": EXIT main_loop
140  CLS
150 END REPeat main_loop
152 STOP
154 :
160 REMark ===========
162 REMark definitions
164 REMark ===========
166 :
170 DEFine PROCedure ask_questions
180  count=0
190  PRINT "Does it have two legs?"
200  process_answer
210  PRINT "Can it walk?"
220  process_answer
230  PRINT "Can it fly?"
240  process_answer
250  PRINT "You were thinking of a ";
255  SELect ON count
260   =1: PRINT "horse"
270   =2: PRINT "man"
280   =3: PRINT "sparrow"
285  END SELect
290 END DEFine ask_questions
300 :
310 DEFine PROCedure process_answer
315  REPeat control
320   INPUT "       y or n   ";z$
330   IF z$="y" OR z$="n"
332    EXIT control
334   END IF
335  END REPeat control
340  IF z$="y": count=count+1
350  PRINT
360 END DEFine
370 :
380 DEFine PROCedure initialise
390  CLS #0
400  BORDER 7,4
410  PAPER 1
420  INK 7
430  CLS
440 END DEFine initialise
450 :
460 REMark =========
470 REMark END SPURT
480 REMark =========
```

A HACKER'S CHRISTMAS

by Stan Veit

Don't give me clothes for Christmas,
I can't use another loud tie.
Sweet smelling stuff to rub on my face,
I usually pour down the drain.
Scotch is not bad, but I drink less and less.
I've completely stopped drinking Rye.
If you ask what I want, I can give you a list without even racking my brain.
There's the new Winchester drive with billions of bytes that I'll never fill 'till I die.
There's that graphics board with 10,000 colors you see without a strain.
The machine that uses a laser to print at the speed of light.
The modem that talks to the universe via space bourne satellite.
The keyless keyboard that puts my every thought directly into RAM.
The pocket computer that projects its screen on to any handy wall
With a three-inch hard disk and folding keyboard. If you ask, I want it all!
But things being what they are, I'll settle for less and I ask without any risk.
For some paper to print, a box of disks, a game to play, a new language to learn. A computer book to read.
How well I know that most of the dough, will go for things for the kids.
But that's not bad, it makes me happy to see their faces all aglow.
So I'll give my word that in this month of joyous giving
(That starts the minute after Thanksgiving.)
I won't touch the computer until December has passed.
So we all can be together, while we celebrate

Merry Christmas!

Nov. 21, 1984

Jules Gesang
CATS Newsletter Editor
P.O. Box 452
Randallstown MD 21133

Dear Jules
I guess you are inundated with programs for Maryland LOTTO. Well here's another for the TS 2068 Or 1000 1500.

Sincerely,

Myron Criswell
5805 30th Ave.
Hyattsville MD
20782
301 559 5699

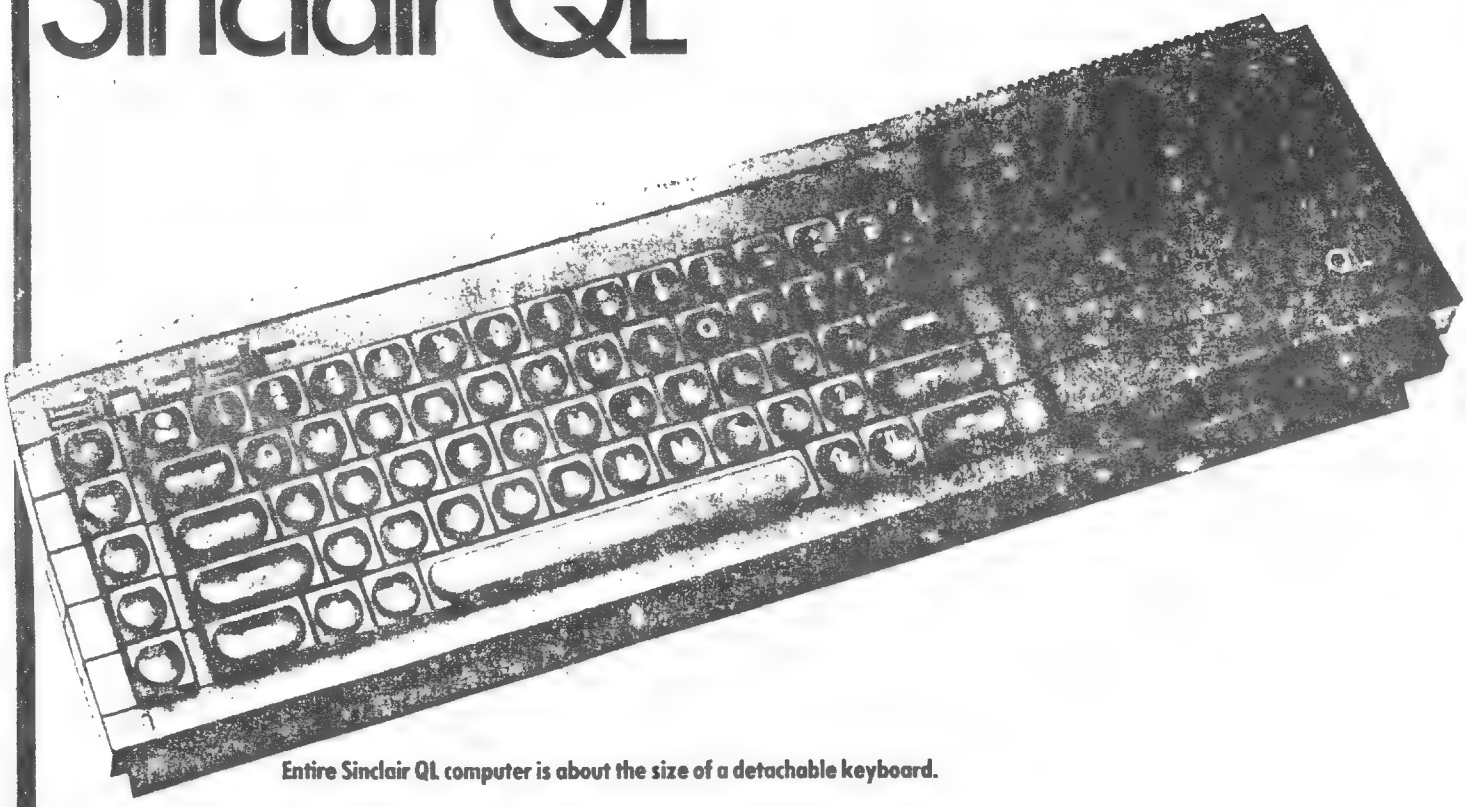
```
  1 REM LOTTO BY MYRON CRISWELL
  5 LET T$="ABCDEFGHIJ"
 10 FOR J=1 TO 10
 20 DIM T(6)
 30 DIM A(40)
 40 FOR X=1 TO 5
 50 LET B=INT (RND*39+1.5)
 60 LET A(B)=B
 70 NEXT X
 80 LET X=1
 90 FOR B=1 TO 40
100 IF A(B)=0 THEN GO TO 130
110 LET T(X)=A(B)
120 LET X=X+1
130 NEXT B
140 IF T(6)=0 THEN GO TO 20
145 PRINT T$(J);
150 FOR X=1 TO 6
160 PRINT TAB 5*X;T(X);
170 NEXT X
180 PRINT
185 PRINT
190 NEXT J
200 COPY
210 STOP
9990 CLEAR
9991 SAVE "LOTTO"
9993 RUN
```

A	3	4	11	12	22	24
B	11	17	21	24	33	39
C	9	10	18	22	30	35
D	9	23	24	26	35	38
E	2	3	16	27	35	38
F	9	10	15	23	33	37
G	3	4	13	24	33	36
H	1	4	22	26	35	37
I	2	10	18	19	34	36
J	3	8	12	21	22	31

DAVID H. AHL

Sir Clive Enters The Business Market

Sinclair QL



Entire Sinclair QL computer is about the size of a detachable keyboard.

For Sinclair Research, the QL is a major departure from the low-end ZX computers and is the company's first attempt to enter the business market. On the other hand, the QL is like no other business computer.

The sleekly styled machine houses a 32-bit 68008 microprocessor with 128K of memory. Rather than floppy disks or memory cartridges, the QL has two built-in microdrives (about which, more later). The keyboard has 65 almost-full-stroke keys including five function keys at the left side, IBM-style. The QL also boasts multitasking, windows, and four nifty software packages written by Psion, a company who fancy themselves Britain's answer to Microsoft. Couple all these features with an under $500 price tag and you have a winner, right? Let's see.

All-in-One Design

The entire QL computer is about the same size as the detachable keyboards on desktop machines like the IBM PC and Epson QX-10. The layout is extremely tight, but neat. Indeed, earlier prototypes had a ROM cartridge hanging out the back and there seemed to be some question whether everything would fit inside. We had one of the first production machines, and we are happy to report that everything fits.

The QL uses a 68008 mpu running at 7.5MHz which makes it quite fast. The machine uses many custom chips for I/O, graphics, and the operating system. Three 16K ROMs (EPROMs at the moment) contain the QDOS operating system and Sinclair's version of Basic, called SuperBasic. The QL has 128K of RAM which cannot be expanded further internally, although a 512K external memory add-on is promised in the future.

A slot on the back of the QL can accept a ROM cartridge with up to 32K of memory. Presumably, software packages from Sinclair or third party vendors could be put on such cartridges.

HARDWARE PROFILE

Name: Sinclair QL **Type:** Personal/small business computer **CPU:** 32-bit 68008, 7.5 MHz **RAM:** 128K, expandable to 640K **ROM:** 48K (QDOS and Basic) **Keyboard:** 65 keys (inc. 5 function keys) **Display:** 40, 64, or 80 char x 25 lines 512 x 256 pixels (4 colors) **Sound:** Two pitches **Mass Storage:** Two microdrives (tape cartridges with over 100K each) **Ports:** Two RS-232, two networking, two joystick **Dimensions:** 18.8" x 5.8" x 1.8" **Operating System:** QDOS (proprietary) **Software:** SuperBasic, Psion Quill (word processing), Abacus (spreadsheet), Archive (database), Easel (business graphics) **Documentation:** 400-page User's Guide **Summary:** Sleek, compact all-in-one design with multitasking, windows, and excellent software. Good for serious personal user. **Price:** $499

Manufacturer: Sinclair Research, Ltd.
50 Staniford St.
Boston, MA 02116
(617) 742-4826

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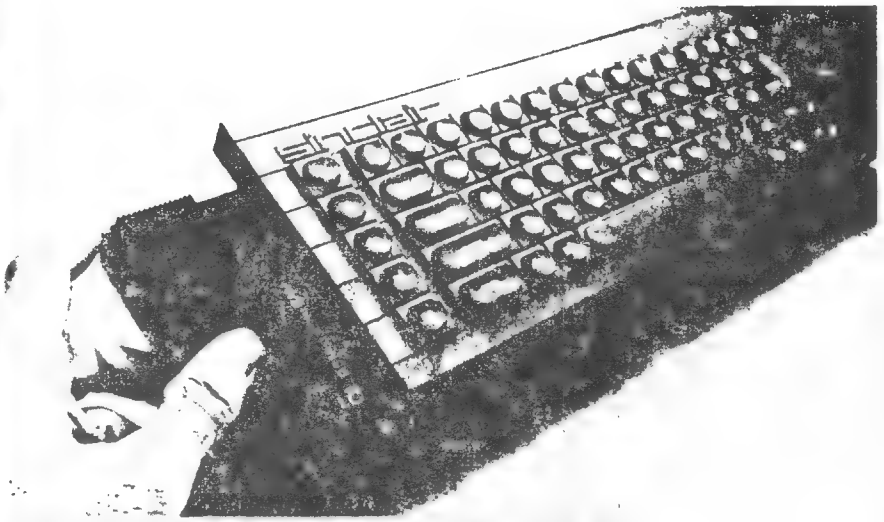
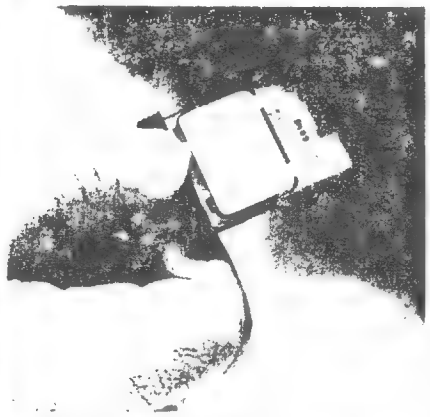


Add-on memory cartridge (512K) plugs into the left end of the QL.



Microdrive tape cartridges are physically small, but hold over 100K.

The QL has two RS-232 serial ports, two "QL Net" ports (to talk to other QL computers), and two joystick ports, but no parallel printer port. As with the Apple IIc, Sinclair believes that a serial printer will meet the needs of most users.

The power supply for the QL is an external unit with one cable to the computer and another to the wall outlet. Curiously, there is no off/on switch; hence, a switchable power strip or protection box is recommended. There is, however, a reset switch on the right side of the machine, and a yellow LED on the keyboard indicates when the QL is on.

Not Quite Full Stroke

Following what seems to be an emerging European tradition, the QL employs a keyboard that has square keys each of which has a rounded depression in the top. As with the keyboard on the German-designed NCR Decision Mate V, we found it took several hours to get used to it. However, if this is your only computer, the keyboard will probably feel as natural as any other within a few days.

The keyboard lies relatively flat on the work surface. To compensate for this, three small plastic feet are furnished to prop up the back of the machine. We found that they slipped around quite a bit and suspect that users will want to attach the feet permanently or leave them off altogether.

Unlike previous Sinclair computers, the QL offers no single stroke keyword entry. Indeed, the keyboard looks rather conventional with its ESC, CTRL, ALT, and function keys. The first three function keys are used the same way in each of the furnished Psion programs. F1 requests help, F2 toggles the upper screen prompt area on and off, and F3 selects the command menu.

Unfortunately, the cursor directional keys are located on either side of the spacebar, left/right to the left, and up/down to the right. We prefer a logical diamond arrangement. The left and right arrows in conjunction with the CTRL key act as delete keys. In fact, the keyboard editor is quite powerful. By using various combinations of SHIFT, ALT, and CTRL with the cursor keys, you can delete words or lines and quickly move the cursor around the text. Like so many low end computers, the QL offers no indication as to whether CAPS LOCK is on or off; this is annoying, especially since you can so easily hit the key by mistake and find yourself with everything in capitals.

Microdrives

A microdrive uses a tiny (1.5" x 1.8") continuous loop tape similar to the ill-fated Exatron stringy floppy. Sinclair has put a great deal of effort into the development of these drives and began to deliver them in substantial quantities for the Spectrum a bit over a year ago. The QL tapes are formatted differently, but the mechanism is the same, so it should be reliable.

Each cartridge contains 200 inches of tape with a theoretical capacity of 255 sectors of 512 bytes each for a total of 128K; in actual use, less than this will probably be stored on a cartridge. Cartridges must be formatted before use; this can be done with a single command from Basic.

All of the applications programs are furnished on microdrive tape cartridges. The program cartridge always occupies the left (1) slot, and a data cartridge, if required, occupies the right (2) slot. Up to six additional microdrives may be connected through an expansion port on the side of the machine.

The microdrive moves the tape at a speedy 28 inches per second; thus the tape completes one circuit every 7 ½ seconds. This would suggest 7 ½ seconds is the maximum access time for data or programs. Not so. In practice, loading a large program or data file took about 70 seconds. Even requesting the help screen in an application program took upwards of a minute.

In monitor mode, an 80-character width screen is automatically split into two vertical windows.

Like standard tape cassettes, each microdrive cartridge has a write protect tab on its right side. We found it a bit unfriendly that the QL will repeatedly attempt to write to a protected cartridge and will not halt until the cartridge is removed.

Perhaps the biggest question is whether the microdrive will handle serious business applications adequately. You can argue that a cartridge holds about 65% as much as a single-density floppy disk and the access time is two or three times as long, but still quite tolerable. Also, in their little binders, four microdrive cartridges take very little space on the shelf. Nevertheless, we don't think that the majority of business users will find the microdrive an acceptable alternative to floppy disks.

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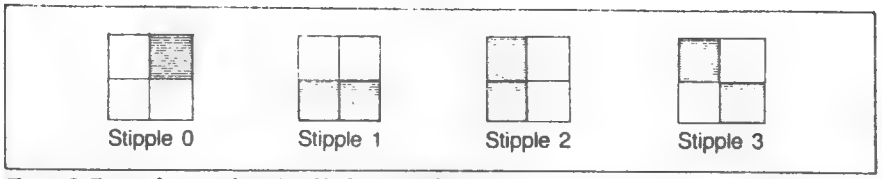


Figure 1. Two colors can be mixed in four stipple patterns.

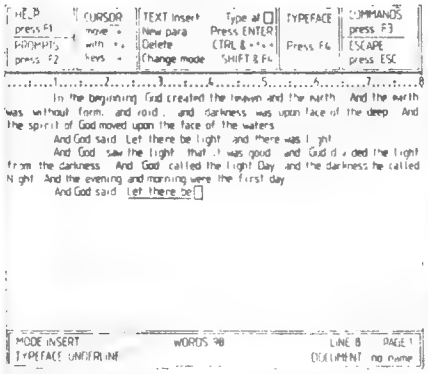


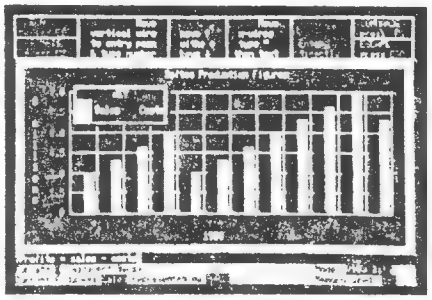
Figure 2. Sample screen from QL Quill word processing package.

Windows and Screens

When the QL is turned on or the reset button pressed, on the screen is displayed the message "F1 for monitor; F2 for television." If you press F2, you get a 64-column display. We had no trouble viewing 64 columns on a standard 13" Sanyo TV set. Indeed, we found we could "push" it to 80 columns. However, to allow the use of older or lower quality TV sets, the character width can be set to 40. Oddly, with the width set to 40, Basic writes only 37 characters across the screen.

While a TV set is a satisfactory display device, it is much more interesting to use a monitor. The QL provides output signals for both RGB and NTSC (composite video) monitors. In monitor mode, an 80-character width screen is automatically split into two vertical windows. The left window shows the program listing while the execution takes place in the right window.

Although the default windows are half the width of the display, you can specify any size window you wish. The BORDER command allows you to add a border to a window. PAPER allows you to specify the background (paper) color, and INK specifies the type color. Within a window you can scroll vertically with the SCROLL command and horizontally with the PAN command. Interestingly, these commands work in two directions (up and down, and right and left). We found these commands did not work



QL Easel is an easy-to-use business graphics package.

quite as we expected; after information was scrolled out of a window it seemed to be gone and we couldn't get it back without re-generating it.

As implied earlier, text resolution can be 40, 64, or 80 characters by 25 lines while graphics resolution is 512 x 256 pixels with four colors or 256 x 256 with eight colors. Colors can be either a solid color or a "stipple." A stipple is a mixture of two colors in one of four specified patterns (see Figure 1). Stipples will be reproduced correctly only on a monitor and will shimmer on a TV set.

The graphics system implemented in SuperBasic is quite powerful and automatically compensates for the rectangular shape of screen pixels when drawing circles and other shapes. A thoughtful touch is the placement of the origin for graphics figures at the lower left (as you are taught in geometry) rather than the upper left (as on most computers). The vertical (y) direction has a default dimension of 100 while the dimension of the x direction depends upon the size of the window. If a figure exceeds the output window, then it is correctly cropped. The SCALE command allows the scale to be changed and the origin moved. Other graphics commands include CIRCLE, ARC, LINE, POINT, and FILL.

SuperBasic

SuperBasic is a refreshing departure from previous Sinclair Basic implementations as it is very close to Microsoft Basic with the addition of several nifty turtle graphics commands and the window commands mentioned above.

In addition to the graphics commands discussed in the previous section, the QL has a MODE command which lets you switch between 512- and 256-pixel screen widths.

For ease of program editing, SuperBasic has automatic line numbering, renumbering, and on-screen editing; although to use this latter facility, you must invoke the EDIT command. Immediate mode commands can also be edited with the last one being held in memory until the next one is entered.

Five turtle graphics commands (from Logo) are implemented in SuperBasic. They include PENUP, PENDOWN, MOVE, TURN, and TURNTO angle (which turns the turtle to a specific heading).

Most of the other facilities will be familiar to users of Microsoft Basic, although the command syntax is occasionally different.

In addition, there are some confusing inconsistencies. For example, in some cases spaces are needed between commands and their arguments, but not in others; similarly, procedures are defined with the arguments in parentheses and then used without them. There are some other strangenesses, all of which contribute to potential confusion for both novice and experienced users.

Operating System

SuperBasic and the various applications software packages all run under QDOS. For the most part, QDOS is transparent to the user as it schedules tasks, allocates resources, performs I/O, polls the keyboard and other ports, and manages memory.

QDOS supports a multitasking environment; therefore, a file can be accessed by more than one process at a time. The QDOS file system can handle both files that have been opened for exclusive use by one program or for shared use.

All I/O is device independent. You simply specify a channel (not a device) with an OPEN statement and direct data and files to that channel. Obviously, you must have an appropriate device connected to that channel if you expect to capture the output.

Word Processing

Furnished with the QL is a package

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produced by Psion, *QL Quill*. This is a "what you see is what you get" word processing system which even allows underlining, superscripts, and subscripts.

The screen is divided into three areas (see Figure 2). The top is a control area and shows the meaning of the function keys, current mode (overstrike or insert), and current typeface. If the command key is pressed, the list of available commands show in this top area. These commands allow changing the format of the document, saving, loading, and the like.

A ruler line appears below the control area to show margins and tab stops.

At the bottom are two lines which show the mode, word count, current line and page, document name, and typeface (normal, bold, or underline).

This leaves 18 lines in the center of the screen for display of your text or, if you toggle off the control area, 22 lines for text.

We used *Quill* quite extensively and found it was very capable.

Like any word processing package, it has some idiosyncrasies that were mildly annoying. In particular, it always indents a paragraph. While you can specify the number of spaces to indent, you can't defeat the indent no matter what. When the system is loaded, it is in right justify mode. If you want an unjustified document and forget to change the format at the start of the session, you can re-format the text later, but it will take nearly two minutes per page to perform the operation. While you are entering a document, the system will occasionally spin the microdrive without warning. Presumably, this is just QDOS doing its thing, but it is disconcerting.

Nevertheless, we have no serious complaints about *Quill*, and we feel it is well matched to the computer.

Other Applications Software

QL Abacus is a full-featured spreadsheet package which would have received high marks in our spreadsheet roundup in the June issue of *Creative*. Like *Quill*, it has a control area at the top of the screen and a two-line status area at the bottom. It has an extensive set of built-in math, statistics, and business functions including net present value, rate of return, and table lookup. About the only obvious missing function was a sort facility.

QL Archive is a database, more properly called a file manager. The default layout is very similar to a 5 x 7 index card, although you can design your own layouts. Since the QL has no character graphics (only Greek and various accented letters), forms must be designed with ASCII characters like hyphens, colons, and brackets.

QL Quill is a "what you see is what you get" word processing system which even allows underlining, superscripts, and subscripts.

The real power of *Archive* becomes apparent when you start to use its own database language, a language nearly as powerful as Basic, but oriented to file manipulation. You can create a named procedure to do exactly what you want and then use it as an additional command just as you use the other *Archive* commands.

We had the most fun with *QL Easel*, a business graphics program. This is an exceptionally friendly program that allows the creation of line, bar (horizontal and vertical), and pie charts. You can vary nearly everything: colors, sizes and shapes of bars, labels, and formats. You can even combine two types of plotting on a single graph.

We made one bar chart and kept adding bars. At first the screen provides space for 12 bars (months), but when you specify the value for the 12th one, the screen is automatically reformatted for 20 bars. This process continues to 30, 45, 78, 100, and eventually to more than 600 bars. Furthermore, if a vertical bar extends beyond the defined range, the screen is automatically reformatted and redrawn. All together, a nifty package!

Documentation

The documentation for the QL is in a single large-format ring binder. It includes a 12-page introduction, 113-page beginner's guide (actually a Basic tutorial), 57-page keyword reference guide, 52-page discussion of the concepts and technology of the QL, sections on each of the four Psion software packages, and a section of miscellaneous technical information (installing printer drivers, transferring data to other computers, guarantee, etc.). In total, the manual contains 400 pages—all typeset and well-illustrated. We were impressed!

Pricing

The QL comes as a bundled unit including computer, User's Guide, power supply, cables, four software packages, four blank microdrive cartridges, and three plastic feet. The U.S. price has been set at $499. Initially, the QL will only be available by mail order directly from Sinclair, but later it may make its way into some retail outlets.

In Summary

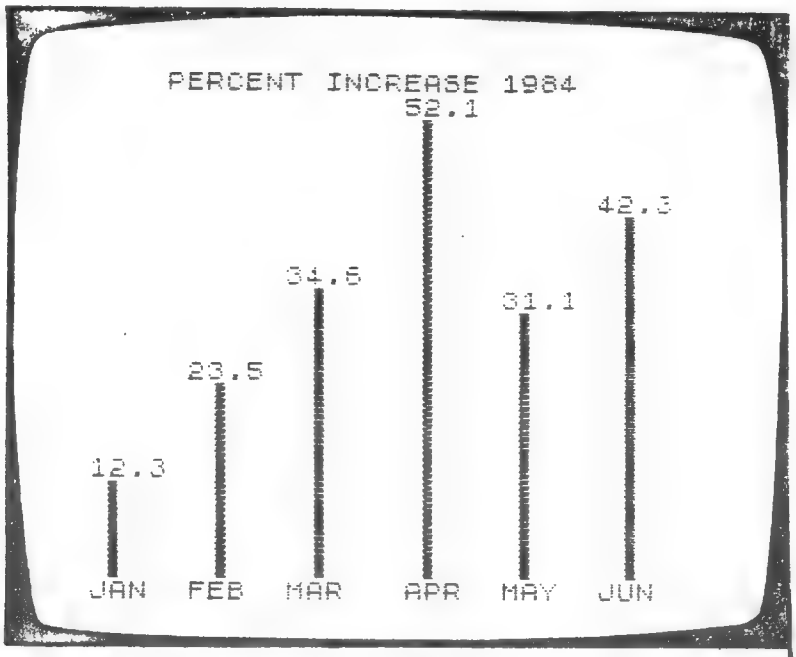
At the moment, the Sinclair QL is the lowest priced 32-bit microcomputer on the market. It is a technologically advanced machine and packs a tremendous amount of capability into a small package.

Although it is bundled with a good complement of capable software for the business market, we feel the microdrive storage system, European-design keyboard, and mail order sales and service policy will prevent the QL from receiving widespread acceptance among business users, at least not as the primary computer of the company.

At the moment, the Sinclair QL is the lowest priced 32-bit microcomputer on the market.

On the other hand, the *QL Easel* business graphics package is outstanding, and it alone may justify the purchase of the system, especially for a business which already has an Epson FX80 (which prints the graphics output exactly). The QL may also represent a good buy for company employees with occasional computing requirements.

In addition, we think the QL may also be a good choice for the serious home user or person running a part-time business. Welcome back to the U.S., Sinclair. ■



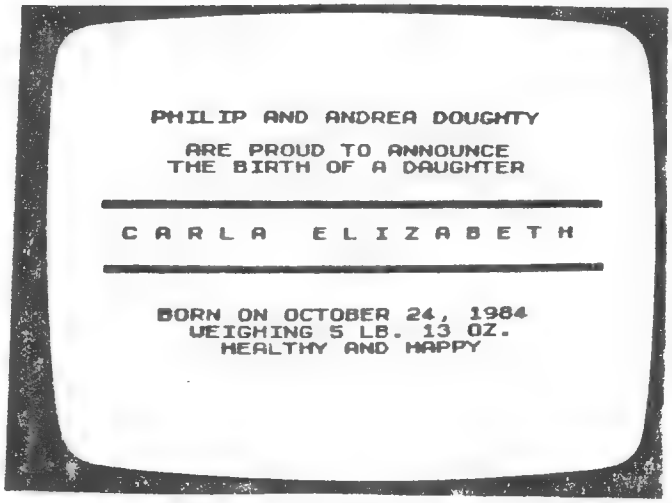
"GRAPH" IS BASED UPON A PROGRAM WRITTEN BY PAUL EZRA. THE LABELS AND BAR PRINTING ROUTINES THAT WERE ADDED MAKE IT A USEFUL BUSINESS PRESENTATION GRAPHICS PACKAGE. A FEW NOTATIONS:

1. LABEL NAMES ARE TRUNCATED TO THREE CHARACTER LENGTH.
2. ANY NUMBER OF VALUES MAY BE PLOTTED, BUT CROWDING AND OVERWRITING MAY BE THE RESULT OF ATTEMPTS TO PLOT NINE OR MORE BARS.
3. SAVE A COMPLETED GRAPH BY DIRECT COMMAND: GOTO 500. WHEN RELOADED, YOUR GRAPH IS REPRINTED.

PHIL DOUGHTY

2K GRAPH

```
  10 LET G=0
  20 LET T$=""
  30 PRINT AT 0,0;"NUMBER OF VAL
UES TO PLOT?"
  40 INPUT N
  50 DIM B(N)
  60 DIM F(N)
  70 DIM L$(N,3)
  80 GOSUB 320
  90 FOR C=1 TO N
 100 PRINT AT 0,0;"LABEL FOR VAL
UE NUMBER ";C;" "
 110 INPUT L$(C)
 120 PRINT AT 0,0;"    ENTER"
 130 INPUT B(C)
 140 IF B(C)>G THEN LET G=B(C)
 150 NEXT C
 160 GOSUB 320
 170 FOR E=1 TO N
 180 IF G>0 THEN LET F(E)=(39*B(
E)/G)
 190 NEXT E
 200 LET H=0
 210 FOR A=4 TO 63 STEP 63/N
 220 LET H=H+1
 230 FOR Z=2 TO F(H)
 240 PLOT A,Z
 250 NEXT Z
 260 UNPLOT A-4,Z+1
 270 PRINT B(H);
 280 UNPLOT A-4,Z-F(H)
 290 PRINT L$(H)
 300 NEXT A
 310 GOTO 340
 320 PRINT AT 0,0;"
                   "
 330 RETURN
 340 IF T$<>"" THEN GOTO 370
 350 PRINT AT 0,0;"TYPE IN THE T
ITLE OF THIS GRAPH."
 360 INPUT T$
 370 GOSUB 320
 380 PRINT AT 0,0;
 390 PRINT TAB 15-LEN T$/2;T$
 400 STOP
 500 SAVE "GRAP"
 510 GOTO 170
```



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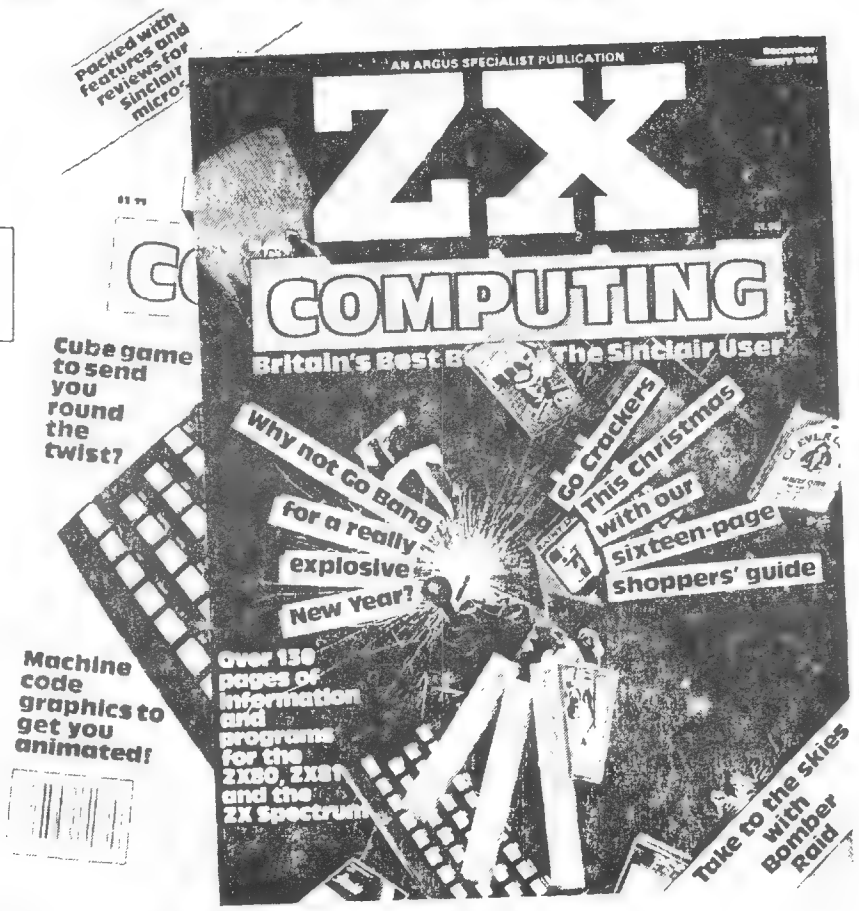

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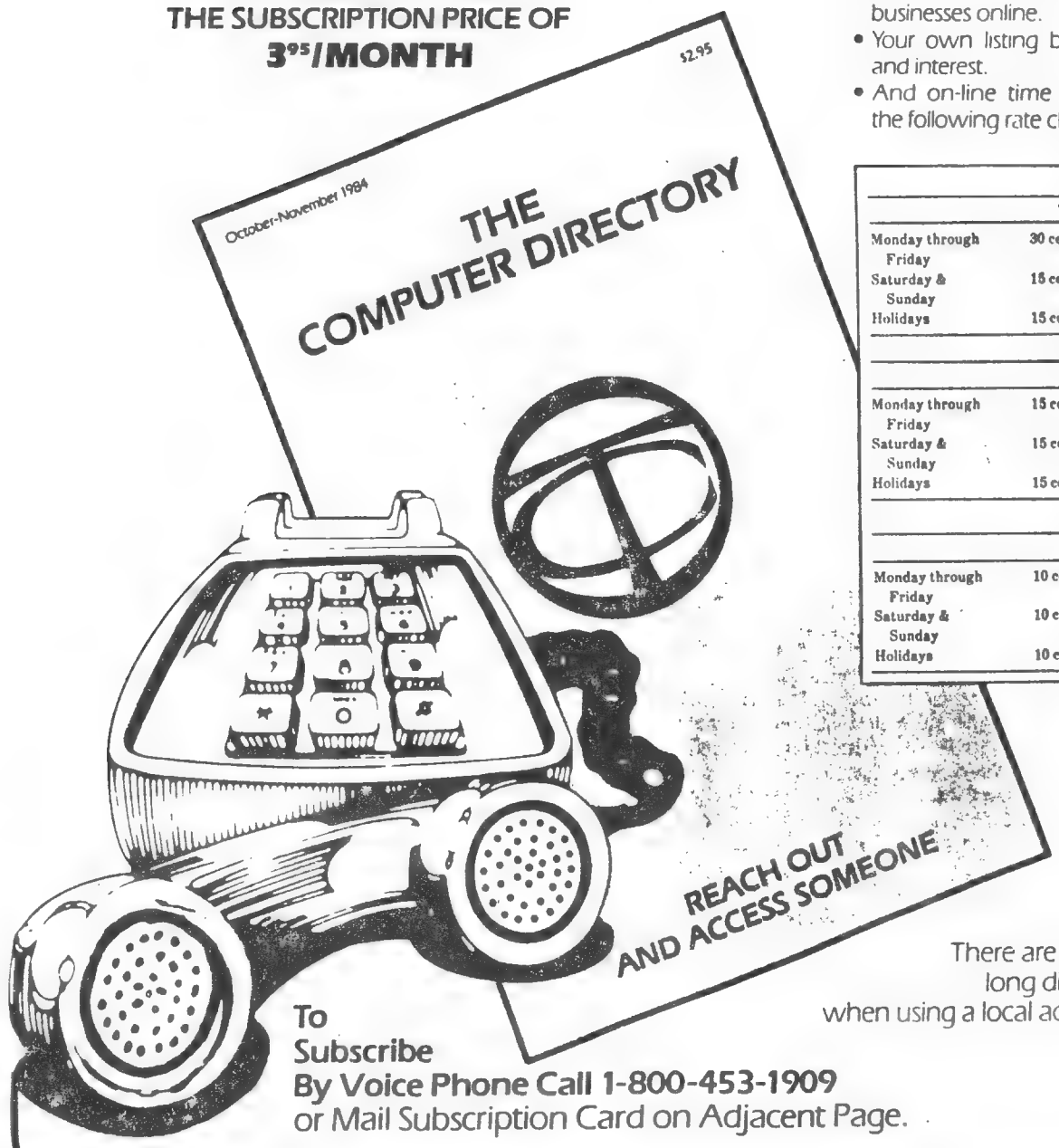

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from pg 7

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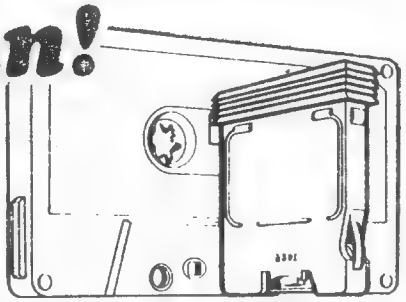

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CS

DO IT YOURSELF EMULATOR

1) You will need a piece of perf-board, about 2 inches by 1 inch, holes on .100 center, two 10K ohm resistors, one .1 MFD capacitor, one single pole double throw switch, 5 feet wire wrap 30ga.

2) Remove the TIMEX rom, making sure not to remove the EXROM (see drawing), and place on non-conductive foam.

3) Make up the 1 X 2 inch component board and place the resistors and capacitor on it as per drawing. Be especially careful that you know which leads are which!!

4) Solder a wire to the ROM socket on the 2068 computer board, to Pin 27, and take this wire to the common lead on the switch, which should be put through the case by the monitor RCA plug. There is room for this by this area, and it will be out of the way when you are using the machine.

5) You should then solder the pins of the two ROM's together, attaching all except Pin 27. These two Pins should stick straight out from the piggyback unit, and one lead of each should go to the side of the resistors that are opposite the Power coming in from Pin(s) 28 of the ROM's. One side of the capacitor has to be taken to signal ground, which is Pin 14 on the ROM's. After you have made all the connections to the Perf-board, wrap the entire unit with tape to Prevent any wires or contact Points from shorting out to the case, or other components. After you have soldered the ROM's together, made all conections to the switch, Perf-board and the ROM socket, replace the ROM unit and close the case up. I would suggest that you replace the ROM unit in the socket before you solder the two connections to Pins 27, Pin 28 and Pin 14, as this will make it easier to judge how long the wires should be. Also, install the switch before you solder the wires to the leads. The two ROM's will piggyback snugly, and should be next to each other. It is a tight fit when the case top is replaced, and the top of the Piggyback ROM unit touches the top Piece which is the keyboard.

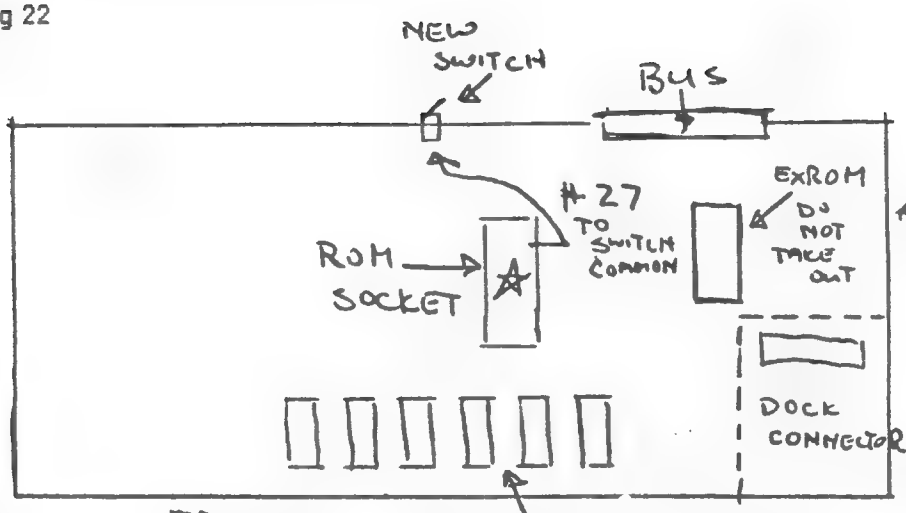
6) If you follow the Plans, do not have any cold solder joints, you will have no Problems in making this conversion. Also, whenever you change from one ROM to the other you should turn all Power off, throw the switch and Power up again.

If you need any info, or have a Problem, you can reach me thru EMAIL, 74745,345 or send a letter and I will do my best to help you. As I stated, this configuration does work, and is the most economical way going, to get the 2068 to become a SPectrum!!!

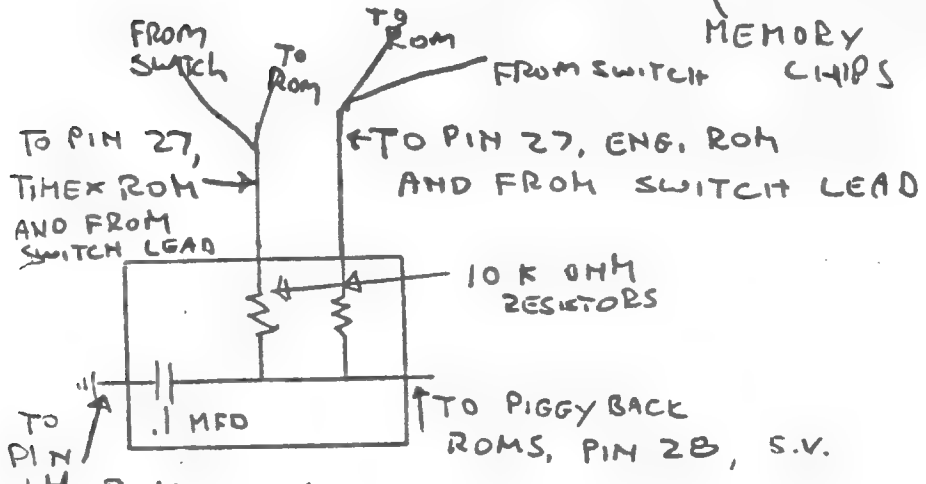
Pete Geller 74745,345

cont pg 23

from pg 22



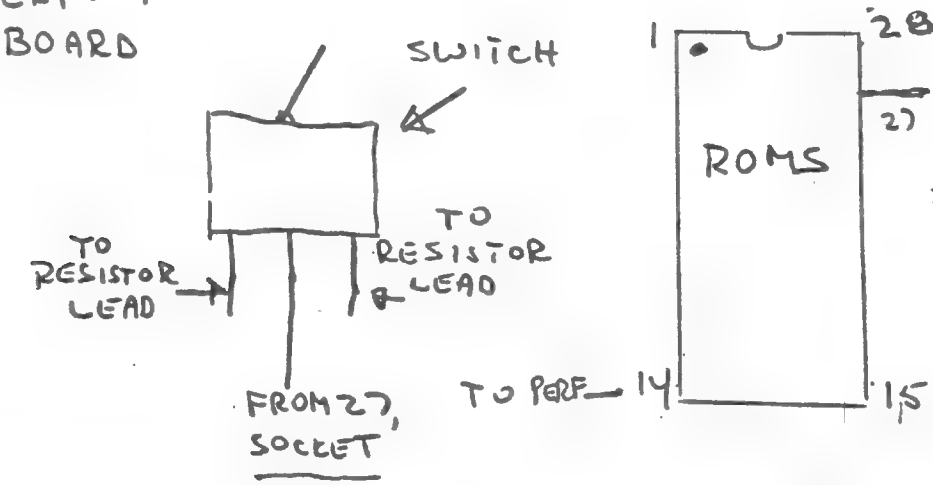
COMPUTER BASE, (CASE OPEN)



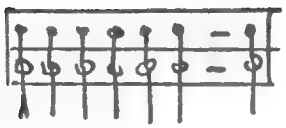
PERF. BOARD

SPECIAL NOTE

1) THE TWO LEADS FROM THE SWITCH GO TO THE TWO RESISTORS THAT GO TO PIN 27 OF EITHER ROM.



** PIN 27 DOES NOT GO INTO COMPONENT SOCKET,

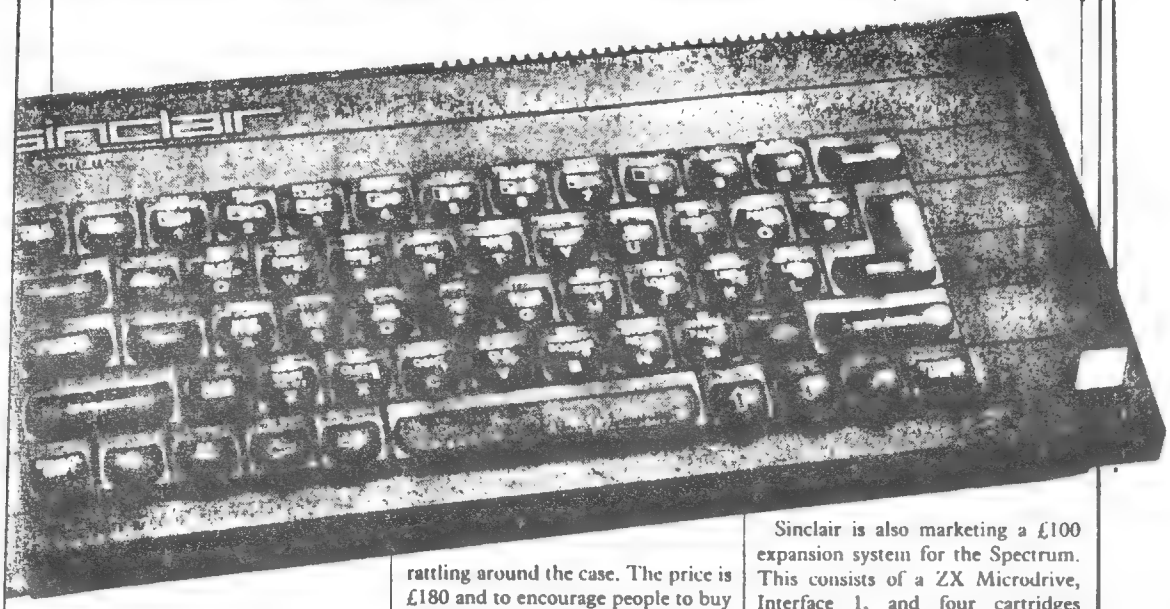


SIDE VIEW OF ROMS, PIGGY BACKED

1) ALL PINS EXCEPT 27 SOLDERED TOGETHER

PINS 27 STICK STRAIGHT OUT AND DO NOT TOUCH EACH OTHER

New Sinclair looks like a sawn-off QL, performs like a Spectrum



SINCLAIR'S NEW Spectrum Plus or + as he prefers to call it is nothing more than a Spectrum in a new QL style box with rellish keyboard and a reset button, plus six pieces of software Scrabble, Make a Chip, Chequered Flag, Chess, Vu-3D and the Tasword 2 word processor.

The keyboard is described as "professional" but despite company claims that Sinclair was "very keen to have a robust keyboard" ours had been amateurishly put together — several keys had fallen off and were rattling around the case. The price is £180 and to encourage people to buy the Plus rather than the standard 48K Spectrum the free software deal with the standard Spectrum will be discontinued in the next few weeks. The good news is that thousands of Pluses have already been built so this time there should be no "coming soon — 28 days and counting" saga.

16K Spectrum production is increasingly aimed at overseas markets but Sinclair claims that there are no plans to stop production of the standard machine. Sinclair will be making 200,000 computers a month this winter.

Sinclair is also marketing a £100 expansion system for the Spectrum. This consists of a ZX Microdrive, Interface 1, and four cartridges including an Introduction to Microdrive use, two "business" programs, Masterfile and Tasword Two, a blank cartridge and two of the best fun programs Ant Attack and Games Designer.

One final advantage of the Plus is that is that it is the first Sinclair that can stand on its own feet. The retractable legs give you a proper keyboard angle. The original Spectrum had none and the QL's continually fall out.

SOMETHING FOR YOUR WRIST THAT WILL BLOW YOUR MIND.

THE SEIKO PC DATAGRAPH:

Looping the 2068

by Murray and Caroline Barasch

Here's our program to draw (on the 2068) an ellipse with center at X,Y; semi-major axis (half width) A; semi-minor axis (half height) B; rotated from the horizontal by angle R (radians, not degrees).

```
10 INPUT "INPUT X,Y,A,B,R"`X`Y`A
`B`R
20 FOR T=0 TO 2*PI STEP .05
30 PLOT X+A*COS T*COS R-B*SIN T*
SIN R,Y+A*COS T*SIN R+B*SIN T*CO
S R
40 NEXT T
```

This was based on parametric equations for the ellipse, modified by rotation through angle R and translated to a new center.

Editor's Note

The INPUT statement on the 2068 is almost as flexible as the PRINT. With multiple entries in a single INPUT, you'll have to press ENTER after each variable. To convert to the 1000, just put in seperate INPUT statements, and remember to keep the numbers smaller.

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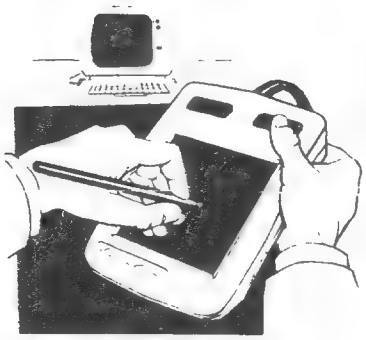

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T/S 2068 Keyboard Scanning

Most programs require user interaction through the keyboard,and use the INPUT or INKEY$ functions to do this job. This article will dis- some alternativeways to input through the keyboard.

Method #1: Hardware generated interrupts are used in the 2068 to update the TV frames counter and to scan the keyboard for pressed keys. If a pressed key is found, the character code associated with it is determined and stored in system variable LAST-K.If you POKE a zero in 23560,and then immediately PEEK the same location, the PEEK will return the code for a key pressed between the POKE and PEEK, provided that a scan has occurred in this time interval. To insure a scan, place a USR 737 after the POKE. This method is roughly like an INKEY$ function which returns a code rather than a string variable.

Method #2:If you are willing to use a small amount of machine code, you can directly call the ROM routine which examines the keyboard. This is K-Scan, located at 688d. (In the Spectrum, this same routine is at 028E (hex).)To use K-Scan, you need to know the position code system used in the T/S, and you need to be able to get at the D and E registers, which is where the position codes are located when a return is made from K-Scan to the calling routine. If no key is pressed, D and E hold 255; one key results in 255 in D and the position code in E; two keys results in position codes in both D and E. The position code is a value from 0 to 39, calculated as follows : (47-row #)-(8*column #). Here, a "row" means 5 keys in a half-row, such as A S D F G. Rows are numbered 1 to 8, starting with the lower left row and going up and then down . A "column" consists of 8 keys, such as column 2: Z S W 2 9 O L Break/Space.There are 5 columns, numbered 1 thru 5, starting with the outer keys.(Note that there are two redundant keys which are ignored; these are the space-bar and the right side cap shift; these are keys added by Timex which perform no new function but make the keyboard a bit more like a typewriter).Unlike method #1 or INKEY$, method#2 allows you to handle two keys pressed at the same time.

Method #3: This method uses the IN function. For example, the BASIC statement LET A = IN 65278 will scan the lst row (bottom left, 5 keys) and assign to A a value of 31 if no keys are pressed. (Note: Some published programs using IN are for the Spectrom version 2, whose base value is 255, not 31.) If the keys are pressed the value returned is the base value (31) minus the column value of any key pressed. Column values are 1, 2, 4, 8, and 16 for columns 1, 2, 3, 4, and 5 respectively. The number following IN must meet certain criteria. When expressed as a two byte binary number, the least significant ("low") byte must be the port number of the keyboard (i.e. 254 decimal). The most significant ("high") byte must have a "0" in the bit position corresponding to the row to be scanned. In the above example, 65278 in binary has as its high byte 11111110; since the zero is in the lst bit position, the lst row will be active when this statement is executed. Rather than get involved in decimal-binary conversions, you can also use a statement like: LET A = IN (256*BIN 11111110 + 254) to do the same thing. Note too, that you can put a zero in any position, or in any number of positions, in the binary number and simultaneously scan any combination of of rows with a single statement. (But, if you scan two rows at once, you cannot tell which row of the two a pressed key is in.) The BASIC equivalent of K-SCAN can be produced, of course, using eight IN statements. But unlike K-SCAN, you can detect the pressing of more than two keys.

Mike Morris

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SECURITY 1000

It is always possible to copy any program by using a dual cassette deck. So, the first step in program security is to make it impossible to access or tamper with your programs. The following program is the closest I have reached to a perfectly safe program.

An Access Code is asked for. If the entered code is incorrect then the program will NEW itself. If the BREAK key (or STOP key during the INPUT prompt) is pressed then the program will stop but it will be impossible for the tamperer to LIST, EDIT, or RUN the program. The computer appears to contain no program in its memory.

Of course, if the hacker knows to reset the address 16509 to 0 then the program will run without any problems, but I am sure that this simple program could be extended to include many other faulty address values and at least make the program very troublesome to break into.

-David Kulp

```
  10 REM THIS IS OUR PROGRAM
  20 PRINT "HELLO--GOODBYE"
  30 STOP
9900 SAVE "SECURITY"
9910 POKE 16509,73                *
9920 PRINT "ENTER THE ACCESS COD
E"
9930 INPUT CODE
9940 IF CODE  PEEK 16509 THEN NE
W
9950 PRINT "ACCESS CODE ACCEPTED"
9960 PAUSE 60
9970 POKE 16509,0
9980 RUN


**ENTER YOUR SPECIAL ACCESS
  CODE IN LINE 9910**
```


1984

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```
   1 REM ART by David Kulp
   2 PAPER 0: INK 7: BORDER 0: C
LS
   5 PRINT #1;"PRESS SPACE BAR T
O CLS."
  10 LET a= INT(RND*255): LET b=
INT(RND*175)
  20 LET x= INT(RND*255): LET y=
INT(RND*175)
  30 LET a1=2: LET b1=2: LET x1=
4: LET y1=4
  40 PLOT a,b: DRAW x-a,y-b
  50 LET a=a+a1: LET b=b+b1
  60 LET x=x+x1: LET y=y+y1
  70 IF INKEY$=" " THEN CLS: PR
INT #1;"PRESS SPACE BAR TO CLS."
 100 IF a>255 OR a<0 THEN LET
a1=-a1: LET a=a+a1
 110 IF x>=255 OR x<=0 THEN LET
x1=-x1: LET x=x+x1
 120 IF b>=175 OR b<=0 THEN LET
b1=-b1: LET b=b+b1
 130 IF y>=175 OR y<=0 THEN LET
y1=-y1: LET y=y+y1
 140 GOTO 40
```

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DECEMBER, 1984

DECEMBER MEETING
SATURDAY, DECEMBER 8

JANUARY MEETING
SATURDAY, JANUARY 12

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The mailing address of the Capitol Area Timex/Sinclair User's Group is:

Capitol Area Timex/Sinclair User's group
P.O. Box 725
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CATS is a non-profit special interest organization dedicated to serving the interests of those who own, use, or are interested in learning more about the Timex/Sinclair family of personal computers.

The official contact person for CATS is JULES GESANG:

301*922-0767

Meetings are held on the second Saturday of each month at 2 P.M. in the large meeting room of the New Carrollton Branch Public Library.

Ham Radio Network Information
QZX Net...Wednesdays, 9p.m. local time; 14.345 MHz NV4F NCS
Eastern Regional Sinclair Net...Sundays, 1600 Z; 7.245 MHz KQ2F NCS